

Montana Weather/Precipitation Summary

August 2014 by NOAA's National Weather Service Great Falls Montana

Temperatures averaged above normal across northwestern Montana and near to below average across much of the east in August. While flow patterns were near normal, the upper ridge that is typically over the state in August was not quite as strong. This allowed cooler temperatures and an above normal precipitation pattern across much of the state, except the west.

Statewide composite temperatures averaged 0.1°F below normal for the month. Figure 2 shows the areas of temperature anomalies. The greatest negative anomaly of 2.8°F was at Big Sky, while the greatest positive departure was at West Glacier, 2.9°F above normal. The warmest average monthly temperature was 73.7°F at Fort Peck, and the coolest was 48.3°F at Placer Basin. For the past 12-months, the statewide composite average temperature is 0.9°F below normal. Seven of the past 12 months have recorded temperature averages below normal.

The monthly departure from normal for precipitation across Montana is shown in Figure 3. This shows that above normal amounts dominated. Two large storm systems brought heavy rain to parts of the state. The first affected eastern Montana from the 14th-16th, and the second affected much of the state from the 20th-25th. This brought record amounts of precipitation to much of central and northeastern Montana for the month. Close to 50 locations set new all-time August maximum precipitation values. The highest amount was 12.75 inches at Grass Range. Overall, August averaged 2.42-inches above normal, or 3.72 inches. This is the highest composite August value of record. The old record was 2.84 inches in 1933. The statewide composite precipitation for the past 12 months is 3.38-inches above normal.

On a statewide average, winds were again below normal this month. This was the 9th calmest August of record. The statewide composite average was 7.4 mph (0.7-mph below normal), with the 12-month average running 0.4 mph below average. The fastest average speed was 13.4 mph at Logan Pass, while Ekalaka recorded an average of 10.5 mph. The fastest measured gust of the month, 76 mph, occurred near Ridgeway during a thunderstorm on the 21st.

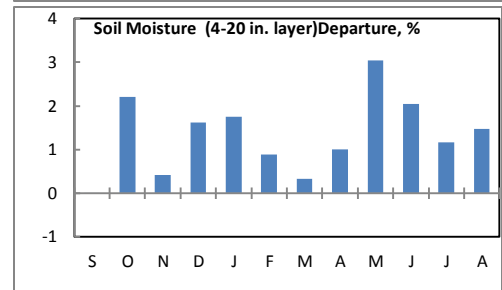
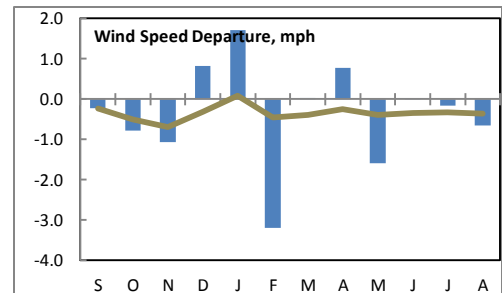
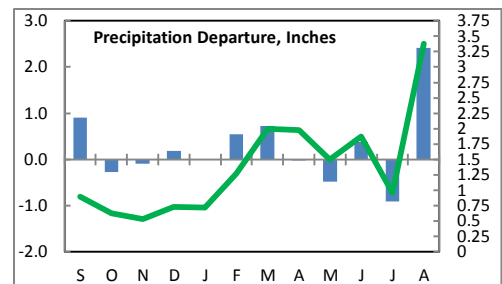
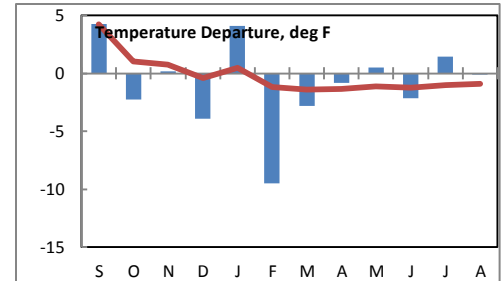
The statewide soil moisture values for August were the second highest of record for the month. See the soil moisture plot to the right. The values are 1.5 points above normal.

Refer to NCDC's State of the Climate report for the latest monthly discussion:

<http://www.ncdc.noaa.gov/sotc/>.

Aug 1 – 14

The first one-half of August was generally dry with above normal temperatures. The warmest temperature of the month, 103°F, occurred on the first near Troy. Isolated thunderstorms swept across northwest Montana on the second causing damage to trees in the Kootenai Falls and Troy areas. This system continued to eastern Montana on the third. Thunderstorm wind gusts reached 66 mph near Fort Benton. Golf-ball size hail fell at Circle and Weldon in McCone County. On the 8th, another round of thunderstorms produced gusts to 56 mph near Augusta. The weather



pattern was in for a change by the 14th. A thunderstorm with heavy rain gave 0.83-inches at Dillon, which set a daily record for the date.

Aug 15 – 25

The first storm system that brought heavy rain to portions of Montana began to influence the state on the 14th, but by the 15th, heavy rain had fallen over parts of eastern Montana. Rain amounts to near three inches fell near Glendive, with other thunderstorms producing wind gusts to 60 mph at Landusky and 58 mph at Jordan. One-inch hail was reported at Deer Lodge and Butte, and golf-ball size hail at Helena. An all-time 24-hour precipitation record was set at Wibaux when 4.03-inches fell. Thunderstorms on the 16th produced gusts to 64 mph at Baker. A short break occurred before the next round of precipitation and thunderstorms caused flooding in and around Missoula on the 19th. Thunderstorms in southeast Montana on the 21st caused high winds and downed power lines in Carter County. A gust reached 76 mph near Ridgeway. Back at Cut Bank, a thunderstorm produced 0.68-inches of rain, setting a daily record for the date. The next major weather system was accompanied by very cool air. On the 22nd, Cut Bank set a daily coolest maximum temperature record of 50°F. Again on the 23rd, Cut Bank set a coolest maximum temperature record of 54°F, while Dillon reached only 51°F. Precipitation was the heaviest of record for August at several locations in central Montana from the 23rd through 25th. Great Falls set a new 24-hour rainfall record on the 23rd, collecting 2.87-inches. On the same date, Glasgow had 2.41-inches, Helena 1.16-inches, Livingston 1.23-inches and Lewistown 3.34-inches – all new records for the date. All-time 24-hour precipitation records were set at Roundup, Lewistown 11SSE, Hobson, Stanford, Jordan, Valentine, Saco, Malta and Grass Range. The heavy rain (over 10 inches in an area from Grass Range into Petroleum County) caused the Missouri River at Landusky to rise 10 feet. The cool conditions continued on the 24th. A new coolest maximum temperature records were set at Glasgow (52°F), and they received 2.30-inches of rain. Temperatures warmed into the 80s the following week. Thunderstorms across north central Montana produced golf-ball size hail at Dodson on the 28th. A cold front brought another round of precipitation to southwest Montana on the 30th. Bozeman set a daily precipitation record, measuring 0.49-inches.

Precipitation/convection

Severe convective weather occurred on seven days in August. Normal for August is 8 days. All of the severe reports consisted of hail and wind. There was a funnel cloud report from western Montana.

For the severe season through August, severe weather was reported on 38 days across Montana. This is one day more than normal.

Summer season (June through August)

For the summer season, temperatures averaged 64.7°F, or 0.3°F below normal. This was the coolest summer period since 2012, and the 50th coolest of record. Heavier than normal precipitation in June and August pushed the composite precipitation total to 7.22", 1.88 inches above normal. This was the 11th wettest summer of record, and the wettest since 1993. Winds averaged at or below normal each month, making the average for the period 8.0 mph. This is the 9th calmest summer period of record.

August summary information:

High Temperature	103°F near Troy (1 st)	Greatest Precip	12.75" at Grass Range (Fergus)
Low Temperature	26°F at Gates Park (26 th)		10.90" at Crystal Lake SNOTEL
Warmest Ave Temp	73.7°F at Fort Peck	Peak Wind Gust	76 mph near Ridgeway (21st)
Coollest Ave Temp	48.3°F at Placer Basin		
Range of Temp departures	-2.8°F at Big Sky to +2.9°F at West Glacier	Highest Ave Wind	11.8 mph at Fort Belknap 13.4 mph at Deep Creek
21 city mean monthly Temperature/Normal	66.7/66.8F 0.1F below normal. 64 th coolest of record (since 1880). 47 th percentile. Jan-Aug 44.8/46.0 1.2F below normal. 56 th coolest of record.	20 city mean monthly wind speed/Normal	7.4 mph/8.1 mph; 9 th calmest of record (since 1936). 12 th percentile. Jan-Aug 9.1mph/9.5 0.4-mph below normal. 31 st calmest of record.
22 city mean monthly precipitation/Normal	3.72/1.30" – 286% of normal. Wettest of record (since 1880). 1 st percentile Jan-Aug 13.95"/11.29" – 2.66" above normal. 9 th wettest of record.		

**Historical Rank of Precipitation (inches)
for the Current Month and Water Year to Date**

Location	Aug	% of Norm	Rank	Pcntl	Oct 1 – Aug 31	% of norm	Rank	Pcntl	Years
Baker	4.78	493%			15.65	149%			16
Billings	1.97	232%	105	94	16.78	125%	96	87	110
Belgrade	2.93	271%	76	97	14.02	108%	60	78	77
Butte	3.07	226%	120	99	12.51	106%	74	61	120
Cut Bank	2.69	232%	96	89	14.60	152%	94	89	106
Dillon	2.78	262%	75	100	9.36	97%	48	64	74
Glasgow	6.72	542%	118	100	14.40	134%	91	80	114
Great Falls	4.39	280%	119	97	18.51	139%	110	90	122
Havre	3.68	332%	133	99	12.33	122%	88	65	134
Helena	2.11	176%	124	92	9.86	97%	59	43	136
Jordan	6.53	549%			14.30	124%			16
Kalispell	1.46	147%	93	77	18.79	120%	108	90	120
Lewistown	6.06	350%	119	100	17.16	111%	76	64	118
Livingston	2.69	242%	107	97	14.81	109%	75	69	108
Miles City	2.22	244%	125	91	13.67	120%	96	70	137
Missoula	0.94	78%	79	58	11.73	90%	51	39	128
Mullan Pass	1.29	97%	47	62	44.82	123%	59	82	72
Wolf Point	7.26	567%			12.99	116%			16
Glendive	7.65	554%	120	100	19.58	159%	106	95	120
Sidney	5.11	441%	76	100	13.47	103%	46	63	76
BZN-MSU	2.84	199%	133	97	20.01	109%	108	84	129

Rankings and Percentiles are 1=driest, higher numbers=wetter.

For an automated version of this chart, updated daily, go to

<http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS>

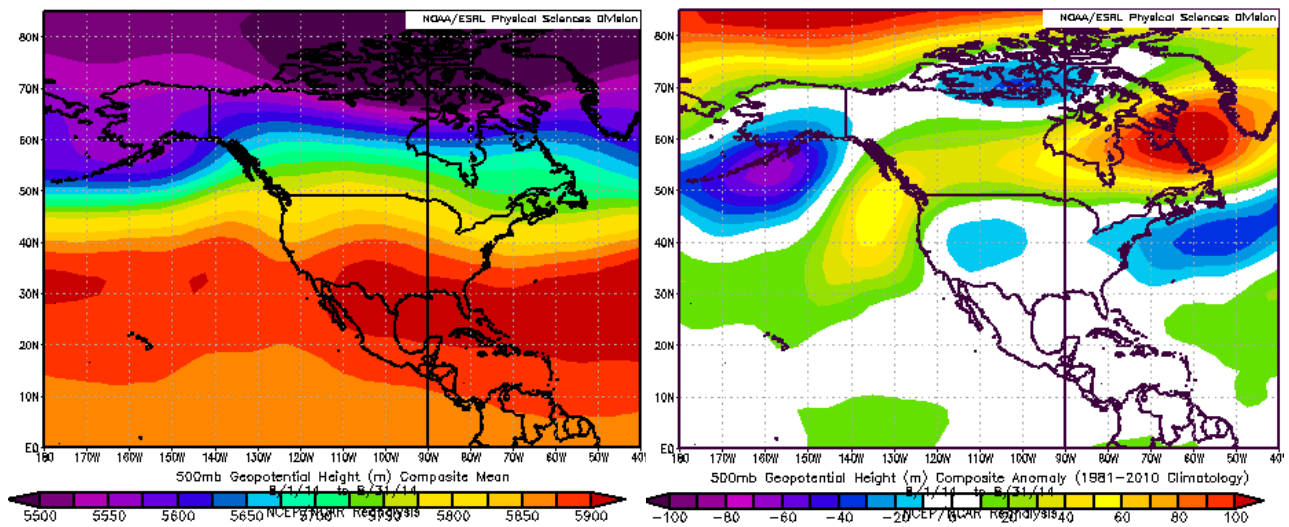


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (top-left) and departure from normal (top-right).

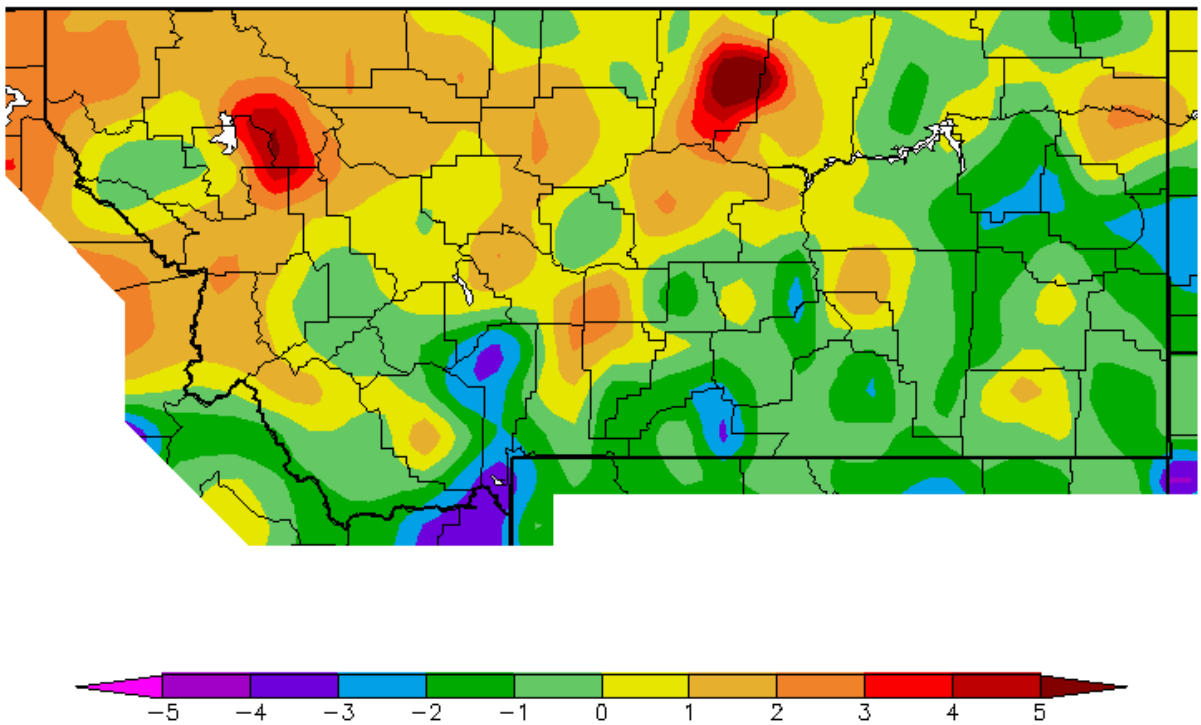


Figure 2. August 2014 temperature departures from normal (°F) (Western Region Climate Center).

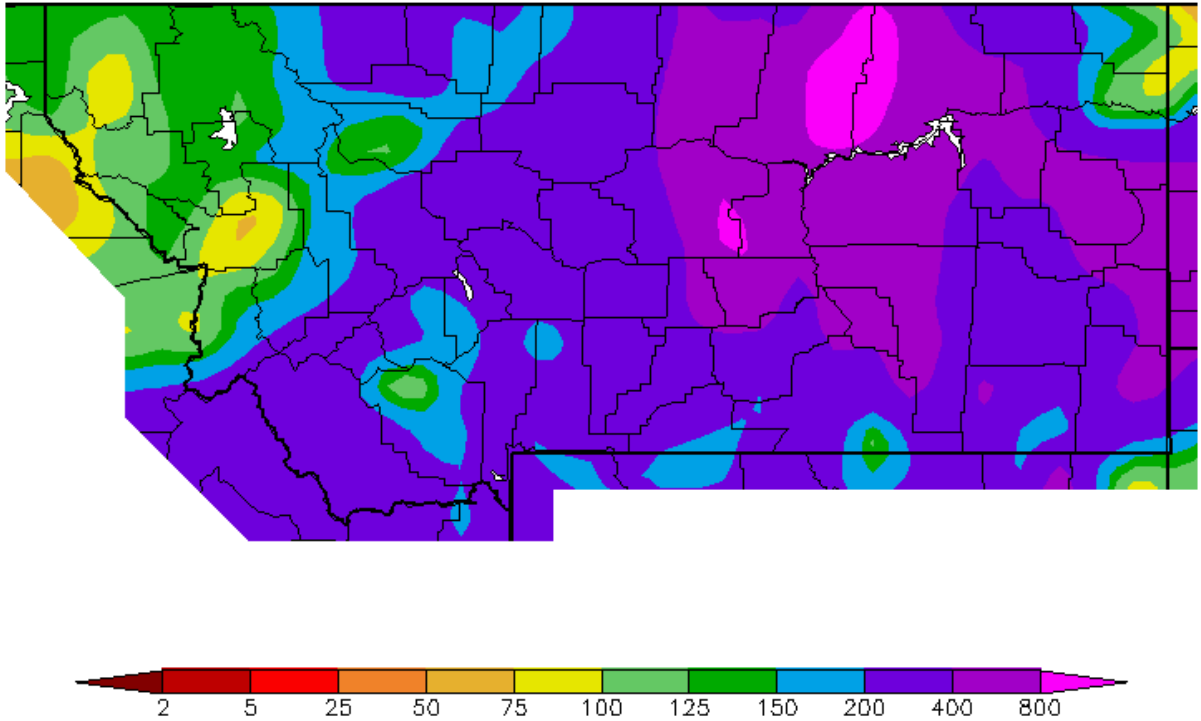


Figure 3. August 2014 precipitation departures from normal (percent) (Western Region Climate Center).

For a state map of % of normal water year precipitation (updated around the 7th of each month), go to:
<http://www.wrh.noaa.gov/tfx/climate/monthlysum/climatesum.php?wfo=tx>

For the latest information on mountain snow pack from the NRCS, go to:
<http://www3.wcc.nrcs.usda.gov/snow/index.html>

For the latest U.S. Drought Monitor, issued weekly by the National Drought Mitigation Center, USDA and NOAA, go to: <http://droughtmonitor.unl.edu/>

These data are preliminary and have not undergone final QC by NCDC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Climatic Data Center (NCDC) <http://www.ncdc.noaa.gov>. Many more links are on the Drought Information Page of the NWS Great Falls web site at <http://www.wrh.noaa.gov/tfx/main/drought.php?wfo=tx>. The climatological record for normals is 1981-2010. The ranking period for temperature, precipitation and snowfall is since 1880. The ranking period for wind speeds is since 1936. The ranking period for soil moisture is since 1995.